

1 **Marked-up version of the Specification**

2 **On Page 5, for those underlined lines 11, 12, 15,32 and 33 as follows:**

3
4 (at 308 nm) excimer lasers and solid-state lasers using harmonic generation form solid-state
5 lasers of Nd:YAG, Nd:YLF and Alexandrite lasers frequency conversions; (c)
6 semiconductor diode lasers at about 980 nm, (1.3-1.55) microns, and (1.8-2.1) microns; (d)
7 diode-pumped solid state lasers having wavelength range of about (190-355) nm and (2.7-
8 3.2) microns such as diode-pumped Er:YSGG, Er:YAG, Nd:YAG and Er:glass. and; (e)
9 diode lasers having wavelength at about 980 nm, 1.5 microns, and 1.9 microns.

10 According to one aspect of the present invention, the preferable scanning laser energy per
11 pulse on **corneal (changed to scleral)** surface is about (2-20) mJ in IR lasers and about (0.5
12 – 2.0) mJ in UV lasers. Focused spot size of about (0.1-0.5) mm in diameter on **the corneal**
13 **(changed to scleral)** plane is achieved by the focusing lens 3 which consists of at least one
14 spherical lens. The other preferred laser parameter of this invention is the laser repetition rate
15 range of about (5-100) Hz which will provide reasonable surgical speed and minimum
16 thermal effects. The focused beam may be scanned over the **corneal (changed to scleral)**
17 surface to ablate various patterns to achieve the desired sclera expansion.

18 Referring to Fig. 2(A), the laser output from the fiber end having wavelength 2 is
19 connected to the hand-piece 5 and a flat fiber tip 6 such that the output laser beam from the
20 end of the fiber tip is a round-beam with a pre-determined spot size of about (0.1-0.5) mm.
21 Fig. 2(B) shows similar structure to Fig. 2(A), except the output round-spot beam is re-
22 focused by the spherical shape of the tip. Fig. 3 (C) shows the output beam 2 is guided by a
23 conical shape tip such that the beam size at the end of the tip is reduced. Fig. 2(D) shows
24 that the output beam is reflected by 90-degree by a coated fiber tip. Finally Fig. 2(E) shows
25 an output beam spot is a slit-shape having a size of about (0.1-0.5) x (1.5-3.0) mm formed by
26 a cylinder lens attached to the end of the fiber tip.

27 Fig. 3 shows an eye 7 of a presbyopic patient with ablation patterns 9 generated on the
28 scleral area about (0.5-1.0) mm posterior to the corneal limbus 8. The preferred patterns of
29 this invention include a ring-spot having at least one ring with at least 3 spots in each ring,
30 and a radial-pattern having at least 3 radials. The preferred area of the ablation is defined
31 within two circles having diameters about 10 mm and 14 mm posterior to the limbus along
32 the radial direction of **the cornea (changed to sclera)**. We should note that a radial ablation
33 pattern on the **corneal (changed to scleral)** surface may be generated either by an automatic
34
35
36

1 **Marked-up version on page 6 (line 13)**

2 The ablation depth of the sclera ciliary tissue is about (400-700) microns with each of the
3 radial length of about (2.5 - 4.0) mm adjustable according to the optimal clinical outcomes
4 including minimum regression and maximum accommodation for the presbyopic patients.

5 The preferred radial ablation shall start at a distance about (4.0 – 5.5) mm from the corneal
6 center and extended about (2.0-4.0) mm outside the limbus. The preferred embodiments of
7 the radial patterns on the sclera area include at least 3 radial lines or ring-dots in a
8 symmetric geometry as shown in Fig. 3.

9 Still referring to Fig. 3, the preferred embodiments to generate the radial patterns on the
10 sclera area include the following examples. (A) Scan the round laser spot of about (0.2- 0.5)
11 mm in diameter produced from the fiber tips in the radial directions to generate each of the
12 radial lines. Generation of the radial patterns may be done either manually moving the fiber
13 tip along the cornea(changed to scleral) radial direction or by an automatically a scanner or
14 translator. (B) Use a focused slit-beam to generate the radial lines. In case (B), a scanning
15 device is not needed and each of the radial lines may be generated by the slit beam directly.

16
17
18
19
20